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EXAMINER	
LEUNG, JENNIFER A	

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1764	6

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/522,118	Applicant(s) HAM ET AL.	
	Examiner Jennifer A. Leung	Art Unit 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-17 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-17 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 09 March 2000 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4,5 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: "262" in FIG. 9.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because "Ws" has been used to designate both the width of the flow slots or openings (page 8, lines 6-8, in reference to FIG. 6, but not shown) and the distance between the radially innermost corner portions (page 9, lines 2-3, in reference to FIG. 7).

3. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because on page 10, lines 6 and 17, "256" should be changed to -- 260 -- for proper reference to the drawings. Appropriate correction is required.

5. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

6. Claims 8, 11, 16 and 17 are objected to because of the following informalities.

In claim 8, "conduits" (lines 1, 3) should be changed to -- conduit members -- for consistency in claim terminology, as set forth in claim 1, lines 7-8. Likewise claim 16, line 1.

In claim 11, -- extending -- should be inserted after "radially" (line 2) for consistency in claim terminology, as set forth in claim 1, lines 10-11.

In claim 17, "an" (line 5) should be omitted for proper grammatical form.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claim 1, it is unclear as to where the body of the claim begins. The claim is generally narrative, indefinite and appears to be a literal translation into English from a foreign document, thus rendering the claim difficult to search. It is suggested that the claim be rewritten in order to conform to current U.S. practice. Furthermore, the use of the phrase "adapted to" in line 2 renders the claim vague and indefinite, as it has been held that the recitation that an element is "adapted to" perform a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchison*, 69 USPQ 138. Furthermore, "said cylindrical vessel" (line 8) lacks proper positive antecedent basis. See also claim 8, lines 2-3.

With respect to claim 2, the prhase, "the radially outwardly extending side wall portions" (lines 1-2) lacks proper positive antecedent basis.

With respect to claim 7, the phrase, "the radially outer ends" (line 1) lacks proper positive antecedent basis.

With respect to claim 8, "can be" (line 3) is considered vague and indefinite, as whether an element is capable of performing a function does not constitute a positive structural limitation.

With respect to claim 16, it is unclear as to the relationship of "an included angle" (line 3) to "an included angle" set forth in claim 1, lines 16. Likewise, the relationship of "generally radially extending side wall portions" to the pair of "generally radially extending side wall portions" set forth in claim 1, lines 10-11.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-2, 5, 7-13 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koves et al. (U.S. 5,209,908) in view of Nagaoka (EP 0 483 975).

With respect to claim 1, Koves et al. disclose an apparatus comprising:

Inlet and outlet openings (nozzles **62, 72** respectively; FIG. 5; column 6, lines 40-51); wherein

- said inlet opening **62** is in communication with an annular space **52** defined on its outer side by the inner wall **60** of the vessel and the outlet opening **72** is in communication with the interior of an axially mounted member **70** whose outer surface has openings therein which are smaller than the particulate material supported thereby (inherent of member **70**, which passes upward through outlet **72** the effluent vapor that has traversed the annular "catalyst particle retaining" space **52**); and

A ring of separate, hollow conduit members **58** positioned against the inner wall **60** of the vessel and arranged in a vertical direction to fill said annular space **52** (FIG. 5, 6); wherein

- conduit members **58** inherently comprise an internal cross-sectional area formed by a pair of generally radially extending side wall portions and an inner wall portion, depending on the selected shape (i.e. conduit member **58** can take on a variety of shapes, such as rectangular, oblong, square or arcuate; column 3, lines 52-56), said wall portions being integrally joined (FIGs. 1-3; column 3, lines 64-68);
- outer ends of the side wall portions (near knuckle sections **16**; FIG. 2) of adjacent conduit members **58** contact the inner wall **60** of the vessel (FIG. 6; column 7, lines 3-11); and
- inner wall portions of said conduit members **58** have at least a portion of their surface formed by screen members that have flow openings (i.e. perforations) which are of a dimension less than the diameter of the particulate material (column 4, lines 1-8).

Although Koves et al. are expressly silent as to whether the side wall portions on at least some of said conduit members **58** are angled away from each other in a generally radially outward direction, with an included angle less than truly radial relative to the axis of the vessel, and whether the included angle is sufficiently small as to permit the individual conduit members to be moved inwardly relative to adjacent conduit members during an installation or replacement operation, such a configuration would be inherent of the conduit member, depending on which shape was selected. Furthermore, Koves et al. disclose, "Although there is usually provision for a sliding fit between the riser **68** (at the tope of the scallop) and cover plate **66**, frictional forces can restrict relative movement between the scallops **58** and vessel wall **60**," (column 6, lines 52-58). Therefore, the conduit members are admittedly capable of movement inwardly relative to adjacent conduit members. In addition, it would have been obvious to select a small included angle in order to facilitate easy removal of the conduit members, since as Nagaoka et al. cites, "...in radial flow reactors, it becomes necessary after running the reactor for a certain period of time to check a screen portion of the reactor and repair it if necessary," and "repair of the screen portion is usually made outside of the radial flow reactor." (column 4, lines 9-32). In any event, it has been held that changes in size as well as changes in shape involve only ordinary skill in the art. *In re Rose*, 220 F.2d 459, 463, 105 USPQ 237, 240 (CCPA 1955), *In re Dailey* 149 USPQ 47, 50 (CCPA 1966); *Glue Co. v Upton* 97 US 3, 24 (USSC 1878).

With respect to claim 2, Koves et al. (FIG. 2; column 3, lines 58-64) further disclose the end portions (i.e. near knuckle sections **16**) of the side wall portions of each conduit member are joined by an outer wall portion (back side or section **14**).

With respect to claim 5, Koves et al. disclose that the conduit members may comprise a rectangular or square shape (column 3, lines 52-56), and thus inherently the inner wall portions are equidistant from the outer wall portions along their length.

With respect to claim 7, Koves et al. disclose the outer ends of said side wall portions which contact inner wall **60** are not joined to each other (FIG. 6; column 7, lines 23-26).

With respect to claim 8, Koves et al. are silent as to whether the conduits have a cross-sectional area and shape smaller than an opening in the top of the vessel, whereby individual conduits can be inserted or removed from the vessel. However, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the conduit members as such, since conduit members must be capable of being removed from the reactor in cases of repair (column 4, lines 9-32), as taught by Nagaoka et al. In addition, Nagaoka et al. teach a similar structure (catalyst container **4**; FIG. 1) which, like the conduit members above, require the capability of removal from the reactor. To facilitate removal, the container "... has a cross section of a size which enables the container to be carried in and out of the radial flow reactor through an opening formed in an upper or lower portion of the radial flow reactor," (column 5, lines 23-40). In any event, it has been held that changes in size involve only ordinary skill in the art. *In re Rose*, 220 F.2d 459, 463, 105 USPQ 237, 240 (CCPA 1955).

With respect to claim 9, Koves et al. further disclose said ring of separate hollow conduit members **58** are slightly spaced from each other (FIG. 6) and that typically, during start-up, hot vapors contact the relatively thin conduits, which then expand at a different rate than the vessel wall (column 6, lines 58-66). Thus inherently, the spacing is sufficient to accommodate manufacturing tolerance or thermal expansion during operation of the vessel.

With respect to claim 10, Koves et al. disclose a spacing between conduit members, but are silent as to specifically a spacing distance of less than 2% of the distance between the outer ends of the side wall portions of each of said conduit members. In any event, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to adjust the distance between the conduit members to be as such, depending on the intended use of the apparatus and absent showing unexpected results, as it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller, 105 USPQ 233.*

With respect to claim 11, Koves et al. are expressly silent as to adjacent conduit members having their pairs of side wall portions at different included angles. However, the included angles of the conduit members is inherent of the specific conduit shapes selected (conduit member **58** can take on a variety of shapes, such as rectangular, oblong, square or arcuate; column 3, lines 52-56), and therefore it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to construct adjacent conduit members with side wall portions at different included angles, depending on the intended use of the apparatus and absent showing unexpected results. In addition, the use of different adjacent cross-sectional shapes, and thus differing included angles, is a conventionally known design choice as evidenced by Nagaoka et al., who teach a structure similar in structure to the conduit members of Koves et al., wherein catalyst containers **34**, **35** (FIG. 8) having cross sectional shapes different from each other are arranged in combination to form a cylindrical catalyst bed (column 10, lines 20-24).

With respect to claim 12, Koves et al. disclose the conduit members can take on a variety of shapes (column 3, lines 52-56), and therefore inherently, the adjacent side wall portions of

adjacent conduit members would be generally parallel to each other, depending on the specific shape selected. Furthermore, providing parallel side wall portions is a conventionally known design choice, as evidenced by Nagaoka et al., who teach structures **34** and **35**, as discussed in claim 11 above, comprising parallel side wall portions (FIG. 8).

With respect to claim 13, Koves et al. disclose the conduit members can take on a variety of shapes (column 3, lines 52-56), and therefore it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to provide alternating conduit members having generally trapezoidal and generally rectangular cross-sections, depending on the intended use of the apparatus and absent showing unexpected results. Also, to further illustrate conventionality, the structures **34** and **35** of Nagaoka et al., as discussed in claim 11 above, comprise a combination of generally trapezoidal and rectangular cross-sectional shapes (FIG. 8).

With respect to claim 16, Koves et al. disclose the conduit members can take on a variety of shapes (column 3, lines 52-56), and therefore it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to provide conduits having generally trapezoidal shaped cross-sections and generally radially extending side wall portions, depending on the intended use of the apparatus and absent showing unexpected results. Although Koves et al. are expressly silent as to whether the side wall portions are angled away from each other at an included angle less than truly radial relative to the axis of the vessel, such a configuration would be inherent of the conduit member, depending on which shape was selected. In any event, it has been held that changes in size as well as changes in shape involve only ordinary skill in the art. *In re Rose*, 220 F.2d 459, 463, 105 USPQ 237, 240 (CCPA 1955), *In re Dailey* 149 USPQ 47, 50 (CCPA 1966); *Glue Co. v Upton* 97 US 3, 24 (USSC 1878).

9. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koves et al. (U.S. 5,209,908) in view of Nagaoka (EP 0 483 975), as applied to claim 1 above, and further in view of Evans et al. (U.S. 5,118,419).

With respect to claim 3, Koves et al. disclose the side wall portions and the outer wall portion of said conduit members are formed from a single sheet of material (FIG. 1-3; column 3, line 64-68). Koves et al. are silent as to whether the material may comprise metal; however, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to select metal as the material in the modified apparatus of Koves et al. since the use of metal for such conduit screen members is conventionally known in the art, as evidenced by Evans et al. Evans et al. cite, "typically, screen members... are produced by punching a large plurality of small oblong slots into a sheet of metal which is then formed and welded into the desired generally tubular shape," (column 1, lines 38-42).

With respect to claim 4, Koves et al. are silent as to whether said screen members comprise parallel wires spaced to form slots. Evans et al. teach the use of screen members for radial flow applications (FIG. 4; column 1, lines 10-37), wherein the screen members comprise parallel wires **30** spaced to form slots **34**, said parallel wires typically being arranged in a vertical direction (FIG. 3A; column 6, lines 55-63). It would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the screen members in the modified apparatus of Koves et al. to comprise parallel spaced wires, because the wires allow "the formation of slot widths for flow which are much smaller for a given strength of screen than is possible with the perforated plate type scallop [or conduit member]," as taught by Evans et al. (column 6, line 65 to column 7, line 2).

10. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koves et al. (U.S. 5,209,908) in view of Nagaoka (EP 0 483 975), as applied to claim 1 above, and further in view of Schuurman (U.S. 4,540,547).

Koves et al. are silent as to said screen members being retained between flange portions extending from each of said side wall portions and an angle member fixed to said side wall portions. Schuurman teaches conduit members (segments **12**; FIG. 3, 5; column 3, lines 21-61; column 5, lines 12-14) comprising screen members (framework **13** formed by bars **14** and **15**; FIG. 2) retained between angle members **33** (column 4, lines 41-46) which are fixed to the side wall portions of the conduit members. It would have been obvious for one of ordinary skill in the art at the time the invention was made to construct the screen members in the modified apparatus of Koves et al. according to Schuurman because constructing the screen members as such provides ease of manufacture (column 2, lines 11-16). Although Koves et al. and Schuurman are collectively silent as to attachment of the screen member to the side wall portions via a flange portion, the use of flanges as a means for attachment is conventionally known in the art and therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to provide a flange portion to the side walls of the conduit members in the modified apparatus of Koves et al. in order to enable attachment (via a conventionally known method such as welding, for example) of the screen member to the side wall portions.

11. Claims 14-15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koves et al. (U.S. 5,209,908) in view of Nagaoka (EP 0 483 975), as applied to claims 1, 9, 11-13 and 16 above, and further in view of Farnham (U.S. 4,374,094).

Koves et al. are silent as to a sealing plate being attached to said conduit members to prevent particulate material from moving into the space between adjacent conduit members.

Farnham (FIG. 2; column 5, lines 16-21) teaches a radial flow reactor comprising conduit members (scallops **19**) and a retainer screen means **22**, which extends over the side edges of adjacent conduit members and inherently acts as a "sealing plate" by retaining particulate material and thus preventing movement of particulate material into the space between adjacent conduit members. As illustrated in FIG. 2, the retainer screen means **22** is attached to the edges of to the conduit members or scallops **19**.

It would have been obvious for one of ordinary skill in the art at the time the invention was made to provide a "sealing plate" to the modified apparatus of Koves et al. because the "sealing plate" would provide for radial and longitudinal uniformity of flow through the entire catalyst bed, as taught by Farnham (column 2, lines 11-31). Although Farnham does not specifically teach the mode of attachment of the retainer screen means **22** to the conduit members or scallops **19** -- in particular, attachment to specific side edges of the inner wall portion of specific conduit members (i.e. generally rectangular or trapezoidal members in the modified apparatus) -- it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to select a particular attachment point for the "sealing plate" based on intended use in the modified apparatus of Koves et al., absent showing unexpected results.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is 703-305-4951. The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on 703-308-6824. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Jennifer A. Leung
January 24, 2003 JAL

Hien Tran

HIEN TRAN
PRIMARY EXAMINER